Piping ITAAC (A#)

GRP	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
A01	**Design Acceptance Criteria** ASME Section III Piping System Design Report{{DAC}} *(if DAC use approved)*	The [XXX system] as-designed ASME Code Class [1, 2 and/or 3] piping systems comply with ASME Code Section III requirements.	An inspection and analysis will be performed of the [XXX system] as-designed ASME Code ~~[~~Class [1, 2 and/or 3] piping systems documentation required by ASME Code Section III. {{DAC}}	~~The~~ ASME Code Section III Design Report(s) for the [XXX system] as-designed ASME Code Class [1, 2 and/or 3] piping system exist(s) that meet the requirements of NCA-3550. {{DAC}}
	Tier 2 Section 14.3 Discussion As required by ASME Code Section III NCA-1210, each ASME Code Class 1, 2 and 3 component (including piping systems) of a nuclear power plant requires a Design Report in accordance with NCA-3550. An ITAAC analysis will be performed of the [System XXX] as-designed piping systems Design Report(s) to verify the report(s) meets the requirements of NCA-3551. Updated to reflect inspection and analysis activities. Edits made for consistency.			
A02	**Design Analysis** ASME Section III Piping System Design Report - As-built Design Reconciliation	The [XXX system] as-built ASME Code Class [1, 2 and/or 3] piping systems are reconciled with the ASME Code Section III Design Reports for the as-designed piping systems.	An inspection and analysis will be performed of the [XXX system] as-built ASME Code Class [1, 2 and/or 3] piping systems documentation required by ASME Code Section III.	ASME Code Section III Design Report(s) for the [XXX system] as-built ASME Code Class [1, 2 and/or 3] piping systems exist(s) that meet the requirements of NCA-3550.
	Tier 2 Section 14.3 Discussion As required by ASME Code Section III NCA-1210, each ASME Code Class 1, 2 and 3 component (including piping systems) of a nuclear power plant requires a Design Report in accordance with NCA-3550. NCA-3551.1 requires that the drawings used for construction shall be in agreement with the Design Report before it is certified and shall be identified and described in the Design Report. It is the responsibility of the N Certificate Holder to furnish a Design Report for each component and support, except as provided in NCA-3551.2 and NCA-3551.3. NCA-3551.1 also requires the Design Report be certified by a Registered Professional Engineer when it is for Class 1 components and supports, Class CS core support structures, Class MC vessels and supports, Class 2 vessels designed to NC-3200 (NC-3131.1), or Class 2 or Class 3 components designed to Service Loadings greater than Design Loadings. A Class 2 Design Report shall be prepared for Class 1 piping NPS 1 or smaller which is designed in accordance with the rules of Subsection NC. An ITAAC analysis will be performed of the [XXX system] as-built piping systems Design Report(s) to verify the report(s) meets the requirements of NCA-3551.1. Updated to reflect inspection and analysis activities. Edits made for consistency.			

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A03	**As-built Inspection** ASME Section III Code Class 1, 2, and 3 Piping Systems Functional Capability Report	The [XXX system] as-built ASME Code Class [1, 2, and/or 3] piping systems for which functional capability is required is designed to withstand combined normal and seismic design basis loads without a loss to its functional capability.	An inspection will be performed verifying that the as-built piping meets the requirements for functional capability.	A report exists and concludes that each of the as-built lines identified in [Table x.x.x-x] for which functional capability is required meets the requirements for functional capability.
	ITAAC added to reflect functional capability requirements.			
A034	**As-built Inspection** ASME Section III Code Class 1, 2 and 3 Component Data Report	The [XXX system] as-built ASME Code Class [1, 2 and/or 3] components, including piping, are designed, fabricated, installed, inspected and tested in accordance with ASME Code Section III requirements.	An inspection will be performed of the [XXX system] as-built ASME Code Class [1, 2 and/or 3] component documentation required by ASME Code Section III.	~~[XXX system]~~ ASME Code Section III Data Report(s) for the [XXX system] as-built ASME Code Class [1, 2 and/or 3] components, including piping, listed in [Table x.x.x-x] exist(s) that are certified and meet the requirements of ASME Code Section III ~~requirements~~.
	Tier 2 Section 14.3 Discussion The ASME Code Section III requires documentary evidence be available at the construction or installation site before use or installation to ensure that ASME Code Class 1, 2 and 3 components conform to the requirements of the Code. The [XXX system] ASME Code Class [1, 2 and/or 3 components] listed in [Tier 1 Table x.x.x-x] require a Data Report as specified by NCA-1210. The Data Report is prepared by the Certificate Holder or Owner and signed by the Certificate Holder or Owner and the Inspector as specified byNCA-8410. The type of individual Data Report Forms necessary to record the required Code Data is specified in the ASME Code Section III Table NCA-8100-1. An ITAAC inspection will be performed of the as-built Data Reports for [XXX system] as-built components listed in [Tier 1Table x.x.x-x] to (1) ensure the appropriate Data Reports have been provided as specified in Table NCA-8100-1, and (2) the Data Reports have been signed by the Certificate Holder or Owner and the Inspector. Updated to disambiguate 'components' to explicitly include piping. Acceptance criteria updated to include certification. Edits made for consistency.			
A045	**As-built Inspection** ASME Section III Code Class CS Component Data Report	As-built ASME Code Class CS [RPV Internals, Core Supports] are designed, fabricated, installed, inspected and tested in accordance with ASME Code Section III requirements.	An inspection will be performed of the as-built ASME Code Class CS [RPV Internals, Core Supports] component documentation required by ASME Code Section III.	ASME Code Data Report(s) for as-built ASME Code Class CS [RPV Internals, Core Supports] exist(s) that are certified and meet the requirements of ASME Code Section III ~~requirements~~.

GRP	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
	Tier 2 Section 14.3 Discussion The ASME Code Section III requires documentary evidence be available at the construction or installation site before use or installation to ensure that ASME Code CS components conform to the requirements of the Code. The ASME Code Class CS [RPV Internals, Core Supports] components require a Data Report as specified by NCA-1210. The Data Report is prepared by the Certificate Holder or Owner and signed by the Certificate Holder or Owner and the Inspector as specified by NCA-8410. The type of individual Data Report Forms necessary to record the required Code Data is identified in the ASME Code Section III Table NCA-8100-1. An ITAAC inspection will be performed of the Data Reports for Code Class CS [RPV Internals, Core Supports] as-built components to (1) ensure the appropriate Data Reports have been provided as specified in Table NCA-8100-1, and (2) the Data Reports have been signed by the Certificate Holder or Owner and the Inspector. Acceptance criteria updated to include certification. Edits made for consistency.			
A06	**As-built Inspection** RPV Fracture Toughness Requirements	The low alloy steel materials of construction used for the reactor vessel pressure retaining parts satisfy the fracture toughness requirements of 10 CFR 50 Appendix G and ASME Code Section III.	Tests and analyses of the materials of construction will be performed.	ASME Code Data Report(s) (certified when required by ASME Code) exist(s) and concludes that the low alloy steel materials of construction used for the reactor vessel pressure retaining parts satisfy the fracture toughness requirements of ASME Code Section III and the beltline materials have an initial Charpy upper-shelf energy of equal to or greater than 75 ft-lb.
	ITAAC added to reflect 10 CFR 50 Appendix G RPV Fracture Toughness Requirements.			
A0~~5~~7	**Design Acceptance Criteria** Pipe Break Hazards Analysis Report {{DAC}} *(if DAC use approved)*	Safety-related and RTNSS B SSCs are protected against the dynamic and environmental effects associated with postulated failures in high and moderate energy piping systems. ~~The dynamic and environmental effects associated with postulated failures are addressed in the design of safety-related [and RTNSS B] high and moderate energy piping systems.~~	A pipe break hazards analysis will be performed of the safety-related ~~[~~and RTNSS B~~]~~ high and moderate energy piping systems. {{DAC}}	A Pipe Break Hazards Analysis Report exists and ~~C~~concludes that the as-designed safety-related ~~[~~and RTNSS B~~]~~ SSCs are protected against the dynamic effects (pipe whip and jet impingement) and environmental effects (pressurization of compartments, water spray, and flooding) associated with postulated failures in high energy piping systems. • ~~Identifies the environmental conditions (pressurization of compartments, water spray, and flooding) associated with postulated failures in high and moderate energy piping systems on the as-designed safety-related [and RNTSS B] SSCs.~~ {{DAC}}

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	Tier 2 Section 14.3 Discussion Section 3.6.x discusses that a pipe rupture hazard analysis is prepared based on the as-designed piping stress analyses and pipe whip restraint design information. The as-designed analysis is based on piping routings, layouts, and isometrics. An ITAAC analysis of the as-designed Pipe Break Hazards Analysis Report: • Confirms that the as-designed safety-related [and RTNSS B] SSCs are protected against the dynamic effects (pipe whip and jet impingement) associated with postulated failures in safety-related [and RTNSS B] high energy piping systems. • Identifies the environmental conditions (pressurization of compartments, water spray, and flooding) associated with postulated failures in safety-related [and RTNSS B] high and moderate energy piping systems on the as-designed safety-related [and RNTSS B] SSCs. The ITAAC needs to go beyond identification of the environmental conditions to show that the safety-related and RTNSS B SSCs are protected from the environmental effects. RTNSS B should not be in square brackets.			
A068	**As-built Inspection** Pipe Break Hazards Protective Features Verification and Design Reconciliation	Safety-related ~~[~~and RTNSS B~~]~~ systems, structures, and components (SSCs) are protected against the dynamic and environmental effects ~~(pipe whip and jet impingement)~~ associated with postulated failures in high energy piping systems.	An inspection and reconciliation analysis will be performed of the as-built protective features for the safety-related ~~[~~and RTNSS B~~]~~ SSCs.	The inspection and reconciliation analysis concludes that the as-built protective features are installed in accordance with [the approved design], and the as-built **Pipe Break Hazards Analysis Report** concludes that the as-built safety-related and RTNSS B SSCs are protected against or qualified to withstand the dynamic and environmental effects associated with postulated failures in high and moderate energy piping. ~~The protective features for the safety-related [and RTNSS B] SSCs are installed as described in the reconciled Pipe Break Hazards Analysis Report.~~
	Tier 2 Section 14.3 Discussion Subsection 3.6.x provides the design bases and criteria for the analysis required to demonstrate that safety-related [and RTNSS B] SSCs are not impacted by the adverse effects of a high energy pipe failure within the plant. [Table 3.6-x] lists the rooms that contain both high energy pipe break locations and essential SSCs that must be protected. An ITAAC inspection will be performed to verify that the as-built protective features hardware credited in the reconciled Pipe Break Hazards Analysis Report such as pipe whip restraints, jet impingement barriers, jet impingement shields, or guard pipe have been installed using design drawings of sufficient detail to show the existence and location of the protective hardware. The as-built inspection is not intended to verify detailed installation features by executing measurements, recoding data, or verifying materials of construction. In addition, as-built drawing(s) associated with the external flood barriers will be reviewed to verify that the as-built location of the barriers agrees with the location described on the as-built drawing(s). The ITAAC should include the reconciliation analysis, and show protection from the environmental effects associated with postulated failures in high and moderate energy piping systems. RTNSS B should not be in square brackets.			

GRP	ITAAC Category/Type	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
A0~~7~~9	**<u>Design Analysis</u>** Leak Before Break (LBB) Analysis	The [XXX system] ASME Code Class 1 and 2 piping and interconnected equipment nozzles are evaluated for leak-before-break (LBB).	An inspection and analysis will be performed of the as-built ASME Code Class 1and 2 piping and interconnected equipment nozzles.	The LBB analysis for the as-built ASME Code Class 1and 2 piping and interconnected equipment nozzles listed in [Table x.x.x-x] is bounded by the as-designed LBB analysis. A summary of the results of the as-built, plant-specific LBB analysis, including material properties of piping and welds, stress analyses, leakage detection capability, and degradation mechanisms is provided in the LBB analysis report.
	<u>Tier 2 Section 14.3 Discussion</u> Section 3.6 describes the application of the mechanistic pipe break criteria, commonly referred to as leak-before-break (LBB), to the evaluation of pipe ruptures. The leak-before-break analysis eliminates the need to consider the dynamic effects of postulated pipe breaks for pipes which qualify for LBB. An ITAAC as-built analysis, which includes material properties of piping and welds, stress analyses, leakage detection capability, and degradation mechanisms, is performed to verify that the as-designed LBB analysis is bounding for the as-built ASME Code Class 1and 2 piping and interconnected equipment nozzles listed in [Tier 1 Table x.x.x-x]. Acceptance Criteria updated to reflect the contents of the LBB analysis report.			
~~**A08**~~	~~**<u>As-built Inspection</u>**~~ ~~High Point Vent Installation Verification~~	~~Accumulation of non-condensable gases in the [XXX system] does not prevent core cooling.~~	~~An inspection will be performed of the [XXX system] as-built high point vents.~~	~~The [XXX system] high point vents are installed in accordance with [the approved design].~~
	<u>Tier 2 Section 14.3 Discussion</u> Move A08 to system specific ITAAC.			
<u>Additional Notes on Piping ITAAC</u> ITAAC for piping systems related to qualification will be included in a set of ITAAC specific to Equipment Qualification				